

## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on February 27, 2008 has been entered.

Claims 1, 3, 9-10, 20-21, 23, 25, 27, 29-31, 33-34, 36, and 38-39 are pending in the instant application.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 9-10, 20-21, 23, 25, 27, 29, 31, 33-34, 36, and 38-39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stegamat (US 2004/0046500) (of record) in view of Suzuki et al. (US 6198217).

Regarding claim 1, Stegamat teaches an organic light emitting diode device comprising a substrate (Fig. 2, 210; Page 2, Paragraph [0030]), a layer of organic light

emitting material (Fig. 2, 241; Page 3, Paragraph [0051]), a transparent cathode comprising a layer of material with a work function less than 4eV (Fig. 2, 260; Page 2, Paragraph [0034]); Page 4, Paragraph [0064]), a passivation layer comprising boron oxide overlying the cathode (Fig. 2, 270; Page 5, Paragraphs [0072] and [0075]), and an encapsulation layer directly overlying the passivation layer (Page 4, Paragraph [0067]—see 'polymeric encasement layers', note that getter layer 280 is optional), but fails to teach wherein the encapsulation layer comprises a dielectric oxide directly overlying the passivation layer and sealing layers of adhesive and glass.

In the same field of endeavor of encapsulating layers for organic light emitting diodes, Suzuki teaches wherein the encapsulating layer comprises an organic barrier layer, a dielectric oxide layer, and sealing layers of adhesive and glass directly overlying the organic device (Fig. 2, elements 20, 22, 30, & 32; Column 5, lines 49-58; Column 7, lines 15-20; Column 7, lines 53-60; Column 9, lines 35-39), in order to prevent dark spots from forming and enlarging (Column 2, lines 15-30).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Stegamet to have the encapsulating layer comprise an organic barrier layer, a dielectric oxide layer, and sealing layers of adhesive and glass directly overlying the organic device in order to prevent dark spots from forming and enlarging, as disclosed by Suzuki.

Regarding claim 3, Stegamet further discloses wherein the material with a work function of less than 4 eV is calcium (Page 4, Paragraph [0064]).

Regarding claim 9, Stegamet teaches a method of manufacturing an organic light emitting diode device, comprising the steps of taking a substrate (Fig. 2, 210; Page 2, Paragraph [0030]) bearing a layer of organic light emitting material (Fig. 2, 241; Page 3, Paragraph [0051]) and a transparent cathode comprising a layer of material with a work function less than 4 eV (Fig. 2, 260; Page 2, Paragraph [0034]); depositing a passivation layer comprising boron oxide on the cathode (Fig. 2, 270; Page 5, Paragraphs [0072] and [0075]); and depositing an encapsulating layer directly on the passivation layer (Page 4, Paragraph [0067])—see ‘polymeric encasement layers’, note that getter layer 280 is optional), but fails to teach wherein the encapsulation layer comprises a dielectric oxide directly overlying the passivation layer and sealing layers of adhesive and glass.

In the same field of endeavor of encapsulating layers for organic light emitting diodes, Suzuki teaches wherein the encapsulating layer comprises an organic barrier layer, a dielectric oxide layer, and sealing layers of adhesive and glass directly overlying the organic device (Fig. 2, elements 20, 22, 30, & 32; Column 5, lines 49-58; Column 7, lines 15-20; Column 7, lines 53-60; Column 9, lines 35-39), in order to prevent dark spots from forming and enlarging (Column 2, lines 15-30).

Therefore, it would have been obvious to one of ordinary skill in the art to modify the invention of Stegamet to have the encapsulating layer comprise an organic barrier layer, a dielectric oxide layer, and sealing layers of adhesive and glass directly overlying the organic device in order to prevent dark spots from forming and enlarging, as disclosed by Suzuki.

Regarding claim 10, Stegamet further discloses wherein the passivation layer is deposited by thermal evaporation (Page 5, Paragraph [0072]).

Regarding claim 20, Stegamet further discloses wherein the light emitting material is a polymeric light emitting material (Page 3, Paragraph [0051]).

Regarding claim 21, Stegamet further discloses wherein the passivation layer directly overlies the layer of material with a work function less than 4 eV (Fig. 2, 260 and 271; Page 4, Paragraphs [0063]-[0064]; Page 5, Paragraph [0078]).

Regarding claim 23, Stegamet further discloses wherein the encapsulating layer comprises glass (Figs. 1 and 2, 190 & 195; Page 2, Paragraph [0029]; Page 1, Paragraph [0007]). Note that the Examiner understands that glass is inherently SiO<sub>2</sub>.

Regarding claim 25, Suzuki further teaches wherein the adhesive comprises epoxy resin (Column 7, lines 54-60). Motivation to combine is the same as for claim 1.

Regarding claim 27, Stegamet further discloses wherein the passivation layer is deposited directly onto the layer of material with a work function less than 4 eV (Fig. 2, 260 and 271; Page 4, Paragraphs [0063]-[0064]; Page 5, Paragraph [0078]).

Regarding claim 29, Stegamet further discloses wherein the encapsulating layer comprises glass (Figs. 1 and 2, 190 & 195; Page 2, Paragraph [0029]; Page 1, Paragraph [0007]). Note that the Examiner understands that glass is inherently SiO<sub>2</sub>.

Regarding claim 31, Suzuki further teaches wherein the dielectric oxide layer is formed by sputtering (Column 7, lines 15-28). Motivation to combine is the same as for claim 9.

Regarding claim 33, Stegamet further discloses adapting the thickness of the passivation layer to energy of electrons, ions, or fields from which protection is required (Figs. 7 and 8; Page 6, Paragraph [0100]).

Regarding claim 34, Stegamet discloses wherein the passivation layer comprises boron oxide and provides a function of absorbing electrons, ions, and electric fields harmful to the transparent cathode (Fig. 2, 270; Page 5, Paragraphs [0072] and [0075]; Figs. 7 and 8; Page 6, Paragraph [0100]).

Regarding claim 36, Stegamet further discloses wherein the material with a work function of less than 4 eV comprises calcium (Page 4, Paragraph [0064]), and wherein the light emitting material is a polymeric light emitting material (Page 3, Paragraph [0051]).

Regarding claims 38 and 39, Suzuki further teaches wherein the dielectric oxide of the encapsulating layer is  $\text{Al}_2\text{O}_3$  (Column 7, lines 15-20). Motivation to combine is the same as for claims 1 and 9, respectively.

Claim 30 is rejected under 35 U.S.C. 103(a) as being unpatentable over Stegamet (US 2004/0046500) and Suzuki et al. (US 6198217) in view of Tai et al. (US 6656611).

Regarding claim 30, Stegamet and Suzuki teach the invention of claim 9 including an encapsulation layer of  $\text{SiO}_2$ , and wherein the  $\text{SiO}_2$  layer is formed through sputtering (Suzuki Column 7, lines 15-28). In the same field of endeavor of methods of forming  $\text{SiO}_2$  layers for organic electroluminescent devices, Tai teaches wherein  $\text{SiO}_2$  layers are

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suitably formed by either electron beam evaporation or sputtering (Column 5, lines 30-33), thus exemplifying recognized equivalent processes of forming an  $\text{SiO}_2$  in the art. Accordingly, it would have been obvious to one of ordinary skill in the art at the time the invention was made to provide the  $\text{SiO}_2$  layer of Stegamet and Suzuki by electron beam evaporation instead of by sputtering, since the selection of any of these known equivalents would be considered within the level of ordinary skill in the art as evidenced by Tai's teaching.

### ***Response to Arguments***

Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anne M. Hines whose telephone number is (571) 272-2285. The examiner can normally be reached on Monday through Friday from 8:00-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nimesh Patel can be reached on (571) 272-2457. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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